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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Kroll, et al.	:	
	:	Art Unit:
Serial No.	:	
	:	Examiner:
Filing Date	:	
	:	
Attorney Docket No. P-1004A	:	
	:	
	:	
For: EVEN TEMPERATURE LINEAR LESION ABLATION CATHETER	:	

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

In the Specification

Delete the four lines in the CROSS-REFERENCE TO RELATED APPLICATION on page 1 of the application and insert the following cross-reference:

-- This application is a divisional of application Serial No. 09/276,210, filed March 25, 1999, which application is related to Provisional Patent Application No. 60/090,209, filed June 22, 1998. --

Attached as a part of Exhibit A is a new page 1 of the application with this amendment inserted.

Attached as a part of Exhibit B is a copy of original page 1 with the deleted text marked through. A copy of the original application is included with the transmittal documents.

In the Claims

Cancel Claims 1-42.

Please add the following claims:

43. An ablation catheter comprising

an elongate flexible member, and

a conductive ablating element secured to the elongate flexible member, wherein the resistance of the ablating element over its outer surface is predetermined such that during an ablating procedure, the temperature of the ablating element is generally consistent over the length of the outer surface of the ablating section.

44. The ablation catheter of Claim 43 wherein a resistivity profile of the ablating element is predetermined.

45. The ablation catheter of Claim 43 further comprising:

an electrical conductor extending within the member having proximal and distal ends, wherein the proximal end of the conductor is adapted for connection to an external power source and the distal end of the conductor is connected to the conductive ablating element.

46. The ablation catheter of Claim 43, wherein the conductive

ablating element comprises a plurality of electrically connected conductive regions which extend from the center of the conductive ablating element to a first and a second end of the conductive ablating element.

47. The ablation catheter of Claim 45, wherein the electrical conductor comprises a single electrically conductive wire.

48. The ablation catheter of Claim 45, wherein the electrical conductor comprises a plurality of electrically conductive wires.

49. The ablation catheter of Claim 43, wherein the ablating element comprises at least three electrically conductive regions, wherein a first region has a resistance with a first value, a second region has a resistance with a second value, and a third region has a resistance with a third value, wherein the first region is disposed closest to a center of the ablating element and the third region is disposed closest to one end of the ablating element.

50. The ablation catheter of Claim 49, wherein the resistance value of the first region is at least about 0 ohms per centimeter, the resistance value of the second region is at least about 10 ohms per centimeter, and the resistance value of the third region is at least about 100 ohms per centimeter.

51. The ablation catheter of Claim 49, wherein the ablating element has length of at least about four centimeters, the first region has a length of at least about 1.3 centimeters and extends

from a center of the ablating element towards one of the ends of the ablating element, the second region has a length of at least about 0.4 centimeters and extends from said first region toward one end of the ablating element, and the third region has a length of at least about 0.3 centimeters and extends from the second region to a second end of the ablating element.

52. The ablation catheter of Claim 49, wherein the resistance value of the first region is at least about 50 ohms per centimeter, the resistance value of the second region is at least about 250 ohms per centimeter, and the resistance value of the third region is at least about 1250 ohms per centimeter.

53. The ablation catheter of Claim 49, wherein the ablating element has length of at least about one centimeter and the first region has a length of at least about 0.35 centimeters that extends from a center of the ablating element towards one of the ends of the element, the second region has a length of at least about 0.10 centimeters that extends from the first region toward one end of the ablating element, and the third region has a length of at least about 0.05 centimeters that extends from a second region to the end of the ablating element.

54. The ablation catheter of Claim 49, wherein the first region has a length of about 65 to 70 percent of the length of the ablating element that extends from a center of the ablating element towards one of the ends of the element, the second region has a

length of at least about 20 percent of the length of the ablating element that extends from the center toward one end of the element, and the third region has a length of at least about 10 to 15 percent of the length of the ablating element that extends from the center to a second end of the surface.

55. A process for ablating tissue within a body comprising

positioning an electrode of an ablation catheter in the body adjacent to the tissue to be ablated, wherein the ablation catheter comprises the ablation catheter of Claim 43, and

ablating the target tissue with an ablating element of the ablation catheter.

56. The process of Claim 55, further comprising applying an electrical ablating signal to the conductive ablating element at a resistance that increases in value along a length of the ablating element from a midpoint to a non-infinite value at the ends of the ablating element.

57. The process of Claim 55, further comprising

arranging at least three electrically conductive regions of resistance in series on the ablating element, wherein the conductive regions comprise a first region having a resistance with a first value, a second region having a resistance with a second value, and a third region having a resistance with a third value.

58. The process of Claim 57 further comprising

extending the first region over a length of about 65 to 70

percent of the length of the electrode that extends from a center of the electrode towards one of the ends of the electrode;

extending the second region over a length of at least about 20 percent of the length of the electrode that extends from the midpoint toward the end of the electrode; and

extending the third region over a length of at least about 10 to 15 percent of the length of the electrode that extends from the center to the end of the electrode.

59. The process of Claim 58, wherein the extending steps further comprise:

providing the first region with a resistance value of at least about 0 ohms per centimeter;

providing the second region with a resistance value of at least about 10 ohms per centimeter; and

providing the third region with a resistance value of at least about 100 ohms per centimeter.

60. The process of Claim 58, wherein the extending steps further comprise:

providing the first region with a resistance value of at least about 50 ohms per centimeter;

providing the second region with a resistance value of at least about 250 ohms per centimeter; and

providing the third region with a resistance value of at least about 1250 ohms per centimeter.

61. An ablation catheter comprising

an elongate flexible member, and

a conductive ablating element secured to the elongate flexible member, wherein the ablating element comprises a plurality of ablating sections, wherein the resistance of the ablating element varies over the length of the ablating element, and wherein during an ablating procedure the temperature of the ablating section is generally uniform along an outer surface of the ablating section.

62. The ablation catheter of Claim 61, wherein the ablating sections comprise a plurality of ring electrodes.

63. An ablation catheter comprising

an elongate flexible member, and

a conductive ablating element secured to the elongate flexible member, wherein the resistance over an outer surface of the ablating section varies, wherein the ablating element comprises a film of conductive material secured to an outside surface of the elongate flexible member, and wherein during an ablating procedure the temperature of the ablating element is generally uniform over the outer surface of the ablating section.

Attached as a part of Exhibit A are the above-referenced claims to be added as pages 31-43 of the application.

Attached as a part of Exhibit B are marked through original claims.

Basis for the Amendments

The applicants have added new Claims 43-63 to the application for review by the United States Patent and Trademark Office. They claim an ablation catheter comprising a conductive ablating element wherein the resistance of that ablating element varies over the length of the ablating element resulting in a generally uniform temperature on its surface during ablation procedures. Basis for this amendment is contained throughout the application and is particularly disclosed on page 4, lines 5-14; page 4, line 17 through page 5, line 2; page 9, lines 10-13; page 10, lines 13-15; page 15, lines 1-14; page 25, lines 9-21; page 27, lines 9-16; and page 29, lines 10-20. No new subject matter is added by any of these new claims.

DISCUSSION

Virtually all of the claims of the parent application, as originally filed, were allowed by the United States Patent and Trademark Office. The applicants believe there are additional inventions contained in that application which have not been claimed. Specifically, the applicants claim an ablation catheter containing an elongate flexible member and a conductive ablating element wherein the resistance of the ablating element varies over its length such that during an ablation procedure, the outer surface of the ablating element ablates tissue at a generally

uniform temperature when ablating energy is applied to the ablating element.

The applicants assert that this invention is not disclosed by any of the prior art. Specifically, the applicants do not believe that this invention is disclosed by Swanson, et al., U.S. Patent No. 6,076,012 (the '012 Patent), the primary reference cited against the parent application. While the '012 Patent discloses an ablation electrode where there is a goal of maintaining a generally uniform temperature on the ablation electrode during an ablation procedure, there are no components of the ablation electrode which are disclosed which can cause the "generally uniform temperature condition." Rather, the catheter of the '012 Patent merely contains conventional temperature sensing elements **540**, such as thermocouples or thermistors located at the end of each ablating section, which are capable of sensing the temperature of the adjacent tissue and electrode. See column 37, lines 36-50. No structural elements of the ablation catheter are disclosed in the device of the '012 Patent which can cause the temperature of the ablation element to be generally uniform. In contrast, the applicants' new claims claim an element (an ablating element) with a resistance that is predetermined which causes a generally uniform temperature on the tissue during an ablation procedure. The applicants assert that this invention is not disclosed by Swanson, et al. or any prior art.

CONCLUSION

The applicants request that this application be reviewed by the United States Patent and Trademark Office and allowed.

Respectfully submitted,

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Attachment

CERTIFICATE OF SERVICE

I hereby certify that this correspondence is being deposited with the United States Postal Service in an envelope as Express Mail Post Office to Addressee," mailing Label Number **EK985526015US**, addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Dated: Aug 29, 2001 Dorothy

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